LYMAN BRIGGS SCHOOL

College of Natural Science

Lyman Briggs School has a six term sequence in Chemistry and Physics that may be completed to fulfill the School's requirements in Chemistry and Physics. This sequence involves Lyman Briggs School 161 through 163L, and Lyman Briggs School 261 through 263L. It is a coordinated sequence that is comparable to certain courses in the Department of Chemistry and the Department of Physics. Any student who plans to complete only part of the sequence must contact the faculty coordinator of either the Chemistry or the Physics portion.

111. College Algebra
Fall, Winter, Spring, 3(5-0) Placement Test or approval of school. Not open to students with credit in MTH 108, MTH 109, or MTH 111.
Rational and real numbers, functions, inverse functions, polynomials, rational functions, exponential and logarithmic functions, trigonometric functions and their inverses.

112. Calculus I
Fall, Winter, Spring, 3(5-0) LBS 111 or MTH 108; LBS 124 concurrently. Not open to students with credit in MTH 112.
Theory and applications of derivatives to polynomials, rational functions, trigonometric functions and their inverses, logarithmic and exponential functions. Definition and properties of the definite integral. Numerical approximations of definite integrals.

113. Calculus II
Fall, Winter, Spring, 3(5-0) LBS 112 and LBS 124. Not open to students with credit in MTH 113.
Further applications of the derivative to related rates, approximations including Newton's method and graphing. The mean value theorem. Integration techniques, applications, and improper integrals. The conies and polar coordinates.

124. APL-Computer Programming for Scientists
Fall, Winter, Spring, 3(3-0) LBS 112 or concurrently, Interdepartmental with the Department of Computer Science.
APL programming: interactive programming techniques; arithmetic, logical, and extended APL operators; functions; applications to concurrent topics in mathematics; principles of operation of time-shared computers.

131. Science and Technology Studies: Writing I
Fall, Winter, Spring, 4(4-4)
Instruction and practice in expository writing. Paper and report topics on science, technology and human values in Western civilization.

140. Biology I
Winter, Spring, 4(3-3) Not open to students with credit in LBS 212.
The organisms and their environment. Organizational level of organization. Evolution and adaptation as forces for biological variance.

141. Biology II
Fall, Spring, 4(3-3) LBS 140; not open to students with credit in MTH 210.
Cellular structure and function. Maintenance and manipulation of materials, energy, space and information at the cellular and tissue level of organization.

142. Biology IA
Winter, Spring, 1 to 2 credits. May reenroll for a maximum of 4 credits. LBS 140 or concurrently.
Selected problems such as analysis of biological data, interspecific and intraspecific competition, microarthopods inhabiting leaf litter, spring flora, diversity, stability and evolution of natural communities.

160. Physics--Elementary Concepts
Winter, 1(2-0) LBS 162 or concurrently.
Elementary concepts of mechanics, electricity, magnetism and optics.

161. Introduction to Chemistry and Physics I
Fall, Spring, 3(4-0) MTH 108 or MTH 109 or MTH 111 or LBS 111 concurrently; LBS 161L or concurrently or approval of instructor.
Gases and gas laws, kinetic theory, heat and thermodynamics. Equilibria, solutions, acids and bases, ionization and electrolysis.

161L. Introductory Chemistry Laboratory
Fall, Spring, 4(0-3) LBS 161 or concurrently or approval of instructor.
Techniques and instruments in the chemistry laboratory. Includes qualitative, quantitative and synthetic work.

162. Introduction to Chemistry and Physics II
Winter, 3(4-0) LBS 161; LBS 162L or concurrently or approval of instructor.
Basic concepts of atomic and nuclear structure, wave particle duality, the quantum theory and the special theory of relativity, radioactivity, nuclear reactions and elementary particle physics.

162L. Introductory Physics Laboratory
Winter, 1(0-3) LBS 162 or concurrently or approval of instructor.
Introduction to techniques and instruments in the physics laboratory. Selected experiments in classical and modern physics.

163. Introduction to Chemistry and Physics III
Spring, 3(4-0) LBS 162; LBS 163L or concurrently or approval of instructor.
Periodic properties and chemical families, stoichiometry, modern theory of chemical bonding, molecular orbitals. Chemical dynamics and equilibria, some organic chemistry nomenclature and reaction kinetics.

163L. Introductory Chemistry Laboratory
Spring, 1(0-3) LBS 163 or concurrently or approval of instructor.
Continuation of LBS 161.

216. Calculus III
Fall, Winter, Spring, 3(5-0) LBS 113.
Series, sequences, power series including Taylor series, and indeterminate forms. Graphing and vector geometry in 3-space. Differential calculus of functions of several variables through Taylor series and extreme points.

217. Calculus IV
Fall, Winter, Spring, 3(5-0) LBS 216.
Credit may not be earned in both LBS 217 and MTH 310.

232. Science and Technology Studies: Writing II
Fall, Winter, Spring, 4(4-0) LBS 131; sophomores.
A writing course emphasizing investigative expository paper. Paper and report topics drawn from readings in the history and philosophy of science and technology, and other areas of science technology studies.

233. Special Topics in Third Culture Rhetoric
Fall, Winter, Spring, 2 credits.
Guided study of relations between the humanities and sciences. Students submit written work.

For prerequisite purposes the introductory biology sequence LBS 140, 142, 242 may be used in place of Biological Science 210, 211, 212.

242. Biology III
Fall, Winter, Spring, 3(3-0) LBS 141. Not open to students with credit in LBS 211.
Organismal growth and development from molecular genetics through life cycles of selected plant and animal species.

256. Energy Consumption and Environmental Quality (N)
Spring, 3(3-0) Interdepartmental with and administered by Physics.
The role of energy as a fundamental pollutant will be discussed along with the availability of fossil energy sources. Limitations on the safe utilization of both fossil and nuclear energy will also be considered.
261. Introduction to Chemistry and Physics IV
Fall. 3(4-0) LBS 163. LBS 261L or concurrently or approval of instructor; LBS 112 or MTH 112 recommended. Kinematics and dynamics of classical particle and rigid body motion. Fundamentals of atomic, molecular vibration-rotation and nuclear magnetic resonance spectroscopy.

261L. Introductory Physics Laboratory
Fall. 1(0-3) LBS 261 or concurrently or approval of instructor. Continuation of LBS 162L.

262. Introduction to Chemistry and Physics V
Winter. 3(4-0) LBS 261; LBS 262L or concurrently or approval of instructor. Chemistry of non-metals, transition elements and coordination compounds, some organic chemistry. The major emphasis is on descriptive chemistry using principles developed in LBS 161, LBS 162, and LBS 163.

262L. Introductory Chemistry Laboratory
Winter. 1(0-3) LBS 263 or concurrently or approval of instructor. Continuation of LBS 163L.

263. Introduction to Chemistry and Physics VI
Spring. 3(4-0) LBS 261; LBS 263L or concurrently or approval of instructor. Classical theory of electricity and magnetism. Electromagnetic wave motion and wave optics. Selected topics in solid state physics, and the special and general theories of relativity.

263L. Introductory Physics Laboratory
Spring. 1(0-3) LBS 263 or concurrently or approval of instructor. Continuation of LBS 261L.

290. Directed Study
Fall, Winter, Spring. 1 to 6 credits. May reenroll for a maximum of 6 credits. Approval of school. Faculty directed studies in curricular areas which are normally related to regular course offerings.

A. Directed Study—General
1 or 2 credits.

B. Directed Study—Biology
1 or 2 credits.

C. Directed Study—Chemistry/Physics
1 or 2 credits.

D. Directed Study—Computer Science
1 to 3 credits.

295. Independent Study
Fall, Winter, Spring. 1 to 4 credits. May reenroll for a maximum of 12 credits. Approval of school. Student conceived individual courses of study in curricular areas. Preliminary faculty approval and continuing guidance.

A. Independent Study—General

B. Independent Study—Biology

C. Independent Study—Chemistry/Physics

D. Independent Study—Science and Technology Studies

331. Modern Fiction
Fall. 4(4-0) LBS 122 or LBS 131 with a 3.0 or better. Recent fiction and its cultural backgrounds, particularly those of special value to students of science and science education. Students may submit original fiction in partial fulfillment of course writing requirements.

332. Modern Drama
Winter. 4(4-0) LBS 122 or LBS 131 with 3.0 or better. Recent plays which have social and literary significance. Students may submit original dramatic writings as partial fulfillment of course writing requirements.

333. Modern Poetry
Spring. 4(4-0) LBS 122 or LBS 131 with 3.0 or better. Recent poetry of literary and social nature. Students may submit original poetry in partial fulfillment of course writing requirements.

341. Introductory Animal Systematics Laboratory
Fall. 2(1-3) ZOL 303 concurrently. Interdepartmental with the Department of Zoology. Laboratory examination of form and function of representative vertebrate and invertebrate animal.

361. Philosophy of Technology
Fall, Winter, Spring. 4(4-0) Sophomores or approval of school. Interdepartmental with the Department of Philosophy. Methodological notions and problems of the biological sciences such as: observation and measurement, classification, teleological and functional explanation, teleological systems, emergentism, vitalism, value neutrality.

374. Historical Problems in the Biological Sciences
Fall, Winter, Spring. 4(4-0) Juniors or approval of school. Various themes or periods in the biological sciences. The course may emphasize the pattern of theoretical development, changes in explanatory ideas, the interaction of external factors and scientific ideas, etc.

375. Historical Problems in the Physical Sciences
Spring. 4(4-0) Juniors or approval of school. Various themes or periods in the physical sciences. The course may emphasize the pattern of theoretical development, changes in explanatory ideas, the interaction of external factors and scientific ideas, etc.

376. Historical Problems in Technical Change
Fall, Spring. 4(4-0) Juniors or approval of school. Factors which influence technical change. Exploration of both historical and contemporary problems of technology and technical change.

377. The Natural Environment: Perceptions and Practices
Spring. 4(4-0) Sophomores. Factors which have influenced U.S. environmental attitudes as reflected in art and literature. Ways in which changing attitudes have led to changes in legislation and practice.

381. Philosophy of Biological Sciences
Winter, Spring. 4(4-0) Nine credits in science or approval of school. Interdepartmental with the Department of Philosophy. Methodological notions and problems of the biological sciences such as: observation and measurement, classification, teleological and functional explanation, teleological systems, emergentism, vitalism, value neutrality.

490. Directed Study
Fall, Winter, Spring. 1 to 6 credits. May reenroll for a maximum of 12 credits. Juniors and approval of school. Faculty directed studies in curricular areas which are normally related to regular course offerings.

A. Directed Study—General

B. Directed Study—Biology

C. Directed Study—Chemistry/Physics

D. Directed Study—Science and Technology Studies

491. Senior Seminar I
Fall, Winter, Spring. 4(4-0) Juniors or approval of school. Selected problems in the study of science and technology as human activities, using philosophical, historical, literary, social science or interdisciplinary perspectives or methods. Thesis topic refined and outlined.

492. Senior Seminar II
Fall, Winter, Spring. 4(4-0) LBS 491 or written approval of instructor. Research, write, defend and evaluate a significant thesis paper in science and technology studies or related interdisciplinary science problems.

493. Field Experience
Fall, Winter, Spring. 1 to 15 credits. May reenroll for a maximum of 16 credits. Approval of school. Experiential learning related to the public or private practice of science and technology.

495. Independent Study
Fall, Winter, Spring. 1 to 12 credits. May reenroll for a maximum of 12 credits. Juniors and approval of school. Student conceived individual courses of study in curricular areas. Preliminary faculty approval and continuing guidance.

A. Independent Study—General

B. Independent Study—Biology

C. Independent Study—Chemistry/Physics

D. Independent Study—Mathematics

E. Independent Study—Science and Technology Studies